

Contents

Preface	vii
Conference Organization	ix
 METALS AND SEMIMETALS	
Liquid metal microdroplet source for deposition purposes V.V. Vladimirov, V.E. Badan, V.N. Gorshkov and I.A. Soloshenko	1
Optical properties of layers and crystals of spherical particles A. Modinos, V. Karathanos and N. Stefanou	13
A theoretical study of optical properties of thin films M.A. Khan	18
Scanning tunneling potentiometry (STP) studies of gold islands on a thin carbon film J. Besold, G. Reiss and H. Hoffmann	23
Modification of Cu-W superlattices by ion irradiation G. Gładyszewski, P. Goudeau, A. Naudon, C. Jaouen and J. Pacaud	28
An alternative explanation for epitaxial growth: the case of fcc(111) on bcc(110) F. Grey and J. Bohr	35
The crystallization kinetics, growth mechanism, and stability of co-evaporated $\text{NiSi}_{2 \pm 0.2}$ thin alloy films I. Grimberg and B.Z. Weiss	41
Epitaxial growth of platinum on Co(10.0) A. Barbier, B. Carrière, V. Da Costa, P. Ohresser and J.P. Deville	49
Crystallographic and electronic structure of Cr films on Au(100) D. Rouyer, C. Krembel, M.C. Hanf, D. Bolmont and G. Gewinner	54
Electron spectroscopy study of dysprosium thin films deposited on copper substrates B. Demri, C. Burggraf and N. Mesboua	59
Growth of Pt/Cu(111) characterised by Auger electron spectroscopy, core level photoemission and X-ray photoelectron diffraction R. Belkhou, N.T. Barrett, C. Guillot, A. Barbier, J. Eugène, B. Carrière, D. Naumovic and J. Osterwalder	63
Scanning tunneling microscopy on graphite and gold G.M. Guichar, B. Han, M. Morand and M.S. Belkaid	71
Conduction-band dispersion in heteroepitaxial C_{60} J.-M. Themlin, S. Bouzidi, F. Coletti, J.-M. Debever, G. Gensterblum, P.A. Thiry and J.-J. Pireaux	76
Characterization of graphite superficial thin films achieved during friction C. Langlade, S. Fayeulle and R. Olier	83
Hydrogen adsorption states on surfaces of thin transition-metal films in the process of hydride formation E. Nowicka, Z. Wolfram and R. Duś	90
Electron spectroscopy studies on carbon segregation from a mono-crystalline $\alpha\text{-Fe}(111)$ specimen W. Arabczyk, F. Storbeck and H.J. Müssig	94
Residual stress determination by X-ray diffraction in tungsten thin films K.F. Badawi, A. Naudon and P. Goudeau	99
Decomposition of thin palladium hydride films as a source for low temperature atomic hydrogen emission R. Duś, E. Nowicka, Z. Wolfram and W. Lisowski	106

MAGNETIC MATERIALS

Co-based multilayer films as novel magneto-optical recording media S.-C. Shin	110
Magnetic properties of a Pd/Co/Pd ultrathin film studied by polarized neutron specular reflection V.V. Pasyuk, H.J. Lauter, M.T. Johnson, F.J.A. den Broeder, E. Janssen, J.A.C. Bland and A.V. Petrenko	118
Studies of giant magnetoresistive Co-Cu multilayers R.J. Highmore, R.E. Somekh, W.C. Shih, I.M. McLoughlin and J.E. Evetts	124
Structural and magnetic studies in Ni/Ti multilayers M. Porte, H. Lassri, R. Krishnan, M. Kâabouchi, M. Mâaza and C. Sella	131
Spin waves in thin films consisting of two different ferromagnetic materials R. Świrkowicz and A. Sukiennicki	134
Magnetic anisotropy of a transition metal monolayer and bilayer Š. Pick and H. Dreyssé	140
The magnetic behaviour of Fe ₃ Al thin films obtained by cathodic sputtering V. Tutovan and D. Luca	145
Surface phase diagrams of the semi-infinite Ising model with a surface amorphization V. Ilkovič	149
AES and SIMS study of magneto-optical information storage layer structure I. Biczó, V.K. Josepovits, F. Pavlyák and J. Giber	157
On a possible antiferromagnetic-to-ferromagnetic transition in terms of the slab thickness H. Nait-Laziz and C. Demangeat	165
X-ray dichroism of Dy overlayers on a magnetic substrate J. Vogel, M. Sacchi, F. Sirotti and G. Rossi	170
Modifications of structure and magnetism of Ce/Fe multilayers induced by irradiation with low-energy Ar ions J. Thiele, F. Klose, O. Schulte, A. Schurian and W. Felsch	175

SUPERCONDUCTORS

Study of the relation between composition and physical properties of YBaCuO thin films using RBS, NRA, XRD, XAS and $\rho(T)$ J.C. Cheang Wong, C. Ortega, F. Rochet, J. Siejka, I. Trimaille, L.M. Mercandalli, F. Mayca and M. Sacchi	179
YBa ₂ Cu ₃ O _{7-x} thin films integrated on silicon-on-sapphire substrates with high critical current densities Th. Matthée, J. Wecker, H. Behner, P. Bauer and K. Samwer	187
Structural study of MBE-grown DyBa ₂ Cu ₃ O ₇ /Dy ₂ O ₃ films on SrTiO ₃ A. Catana and J.-P. Locquet	192
Surface reactivity and protection of the YBa ₂ Cu ₃ O _{7-x} HTSC compound Z. Rupeng, C.A. Davis, M.J. Goringe, P.C. Healy, S. Myhra and P.S. Turner	198
Studies on as-grown, Cl-covered surfaces of YBa ₂ Cu ₃ O _{7-δ} films R. Lange, H.J. Clemens and W. Mönch	205

CERAMICS, INSULATORS AND OXIDES

Thin film electroceramics A. Atkinson and P.T. Moseley	212
Structure and property of heteroepitaxial TiO ₂ /VO ₂ multilayers H.L.M. Chang, Y. Gao, T.J. Zhang and D.J. Lam	220

The influence of thermal annealing on the structural, electrical and optical properties of TiO_{2-x} thin films M. Radecka, K. Zakrzewska, H. Czternastek, T. Stapiński and S. Debrus	227
The effect of substrate temperature on the properties of sputtered titanium oxide films L. Meng, M. Andritschky and M.P. dos Santos	235
Electrical properties of Cr- and Nb-doped TiO_2 thin films A. Bernasik, M. Radecka, M. Rekas and M. Sloma	240
Role of oxygen vacancies in anodic TiO_2 thin films N. Tit, J.W. Halley, M.T. Michalewicz and H. Shore	246
New approach for preparing blue potassium molybdenum bronze thin films Y.F. Yuan and O.S. Heavens	252
Surface characterization of tetragonal ZrO_2 C. Morterra, G. Cerrato, L. Ferroni, A. Negro and L. Montanaro	257
Supply of hydrogen radicals generated by microwave plasma to the SiN film growing surface during RF plasma enhanced chemical vapor deposition K. Yasui, K. Shimizu, H. Takahashi and T. Akahane	265
Thermodynamic characterization of a $\gamma\text{-Al}_2\text{O}_3$ surface by an exclusively surface O/Cl exchange reaction F. Réti, V.K. Josepovits and I.V. Perczel	271
Unknown Ga_2O_3 structural phase and related characteristics as active layers for O_2 sensors P.P. Macrì, S. Enzo, G. Sberveglieri, S. Groppelli and C. Perego	277
Hydrothermal ABO_3 ceramic thin films M.E. Pilleux, C.R. Grahmann, V.M. Fuenzalida and R.E. Avila	283
Grazing-incidence X-ray characterization of amorphous $\text{SiO}_x\text{N}_y\text{H}_z$ thin films M. Brunel, L. Ortega, Y. Cros and S. Viscaino	289
Electrical resistivity of RuO_x thin films prepared by ion beam sputter deposition H. Kezuka, R. Egerton, M. Masui, T. Wada, T. Ikehata, H. Mase and M. Takeuchi	293
A study of the cation-zeolitic surface interaction by ESR spectroscopy F. Iacomi, E. Trif and E. Popovici	298
Optical properties of $(\text{AgI})_x-(\text{Ag}_2\text{O}-2\text{B}_2\text{O}_3)_{1-x}$ glasses A. Arena, G. Galli, R. Giorgi, A.M. Mezzasalma, S. Patane and G. Saitta	302
The surface structure formed by H_2 desorption from proton-exchanged $\text{H}_y\text{Li}_{1-(x+y)}\text{Mn}_2\text{O}_4$ and its catalytic activity for oxidation of methane and butane K. Sato, Y. Inoue, S. Yasukawa and H. Takahashi	308
Optical absorption and structural characterization of reactively sputtered tellurium suboxide thin films M. Di Giulio, M.C. Nicotra, M. Re, R. Rella and P. Siciliano	313
Thin films of nickel manganese oxide for NTC thermistor applications P. Fau, J.P. Bonino, J.J. Demai and A. Rousset	319
The growth and electrochemical properties of metal-oxide thin films: lithium intercalation C. Julien, L. El-Farh, M. Balkanski, O.M. Hussain and G.A. Nazri	325
Effects of preliminary deposition of Ti on mechanical properties of TiN films on iron M. Carbucicchio and G. Palombarini	331
Zirconia/metal interfaces studied by X-ray photoelectron spectroscopy J.-M. Mariot, S. Harel and C.F. Hague	337
POLYMERS	
Concepts in molecular electronics E. Sigmund, P. Gribi and G. Isenmann	342
Submicron periodic structures produced on polymer surfaces with polarized excimer laser ultraviolet radiation M. Bolle and S. Lazare	349

Thin films of semiconducting polymeric porphyrins E. Kubaszewski, J. Bennett, P. Tomboulia, T. Malinski and L. Czuchajowski	355
Identification by Raman microprobe (LRM) of phenyl groups in thin surface coatings C.A. Davis, Z. Rupeng, J.A.A. Crossley, P.R. Graves and S. Myhra	362
Imaging of polydiacetylenes by atomic force microscopy H. Yamada, S. Okada, T. Fujii, M. Kageshima, A. Kawazu, H. Matsuda, H. Nakanishi and K. Nakayama	366
Electrical conductivity and Seebeck coefficient of some new organic semiconductors V. Sunel, M. Rusu, I. Caplanus and G.I. Rusu	371
Influence of naphthacene doping on the electrical and light-emitting behavior of 8-hydroxyquinoline aluminum based electroluminescent devices T. Wada, Y. Yogo, I. Kikuma, M. Masui, M. Anzai and M. Takeuchi	376
On the current-voltage characteristics of some thin-film sandwich structures of the metal/organic semiconductor/metal type G.I. Rusu	381
Characterization of sulfide/polyaniline and sulfide/polypyrrole contacts D. Tsamouras, E. Dalas, S. Sakkopoulos and E. Vitoratos	388

SEMICONDUCTORS I: THIN FILMS, QUANTUM WELLS AND SUPERLATTICES

Porous silicon: material properties, visible photo- and electroluminescence G. Bomchil, A. Halimaoui, I. Sagnes, P.A. Badoz, I. Berbezier, P. Perret, B. Lambert, G. Vincent, L. Garchery and J.L. Regolini	394
Porous n-silicon produced by photoelectrochemical etching C. Lévy-Clément, A. Lagoubi, D. Ballutaud, F. Ozanam, J.-N. Chazalviel and M. Neumann-Spallart	408
A study on the current-voltage characteristics of porous silicon C.C. Yeh, K.Y.J. Hsu, P.C. Chen and H.L. Hwang	415
Electronic structure and optical properties of silicon crystallites J.P. Proot, C. Delerue, G. Allan and M. Lannoo	423
Unusual strain caused by the twin boundary structure in CdTe(111) films H. Tatsuoka, H. Kuwabara, Y. Nakanishi and H. Fujiyasu	426
The crystallinity of ZnS thin films prepared by MOCVD J.W. Li, Y.K. Su, M. Yokoyama, M. Takahashi, T. Nakata and Y. Hashimoto	433
EPR investigations on ZnS:Mn thin films prepared by hot wall technique T. Nakamura, H. Muramatsu, Y. Nakanishi and H. Fujiyasu	437
Determination of refractive indices of $\text{In}_{0.53}\text{Al}_{0.40}\text{Ga}_{0.07}\text{As}$ and $\text{In}_{0.53}\text{Al}_{0.11}\text{Ga}_{0.36}\text{As}$ on InP in the wavelength range from 280 to 1900 nm by spectroscopic ellipsometry H.W. Dinges, H. Burkhard, R. Lösch, H. Nickel and W. Schlapp	442
Interface defects and inhomogeneities induced by alloy clustering in InAlAs buffer layers grown on InP F. Peiró, A. Cornet, J.R. Morante, A. Georgakilas, K. Zekentes and G. Halkias	447
Red-yellow CdSSe-ZnS SLs and blue-green SrS and CdSSe-SrS SLs double insulating EL devices prepared by hot wall epitaxy H. Fujiyasu, Y. Takeuchi, K. Hikida, K. Masuo, Y. Gotou, T. Kiichi, K. Ishino and A. Ishida	455
Crystallinity of ZnS:Tb,F thin films on green thin film electroluminescent devices prepared by RF-magnetron sputtering Y.J. Lin, Y.K. Su and M. Yokoyama	461
MoS ₂ thin films prepared by sulphurization A. Jäger-Waldau, M.C. Lux-Steiner, E. Bucher, L. Scandella, A. Schumacher and R. Prins	465
Preparation of $\mu\text{c-SiC}$ and its application for light emitting diodes H. Mimura, T. Futagi, T. Matsumoto, M. Katsuno, Y. Ohta and K. Kitamura	473

Epitaxy of layered semiconductor thin films L. Brahim Otsmane, J.Y. Emery, M. Jouanne and M. Balkanski	479
Co-evaporated thin films of semiconducting β -FeSi ₂ M. Powalla and K. Herz	482
Crystallization process of amorphous mixed Si _x Ge _{1-x} thin films M. Bendayan, R. Beserman, F. Edelman, Y. Komem and S.S. Iyer	489
High precision structural study of Si/Si _{1-x} Ge _x superlattices J.-M. Baribeau, D.J. Lockwood and P.X. Zhang	494
Defect induced intermixing in thin Si/Ge superlattices K. Dettmer, F.R. Kessler, W. Freiman, R. Beserman and Yu.L. Khait	501
Interface transient layer of amorphous silicon based multilayers measured by in situ ellipsometry Y. Hatanaka, M. Ohkuwa and T. Yamaguchi	507
Influence of thickness inhomogeneity on the determination of optical constants of amorphous silicon thin films T. Pisarkiewicz, A. Czapla and H. Czternastek	511
Preparation and luminescent properties of SrSe:Ce thin films Y. Nakanishi, T. Ito, Y. Hatanaka and G. Shimaoka	515
Improved luminescence from MOVPE-grown GaAs/AlGaAs single quantum wells using a multiple quantum well buffer A.W.R. Leitch and J.R. Botha	520
Rapid thermal and large area processing of Si and FeSi ₂ films with a line electron beam M. Pauli, M. Döscher, G. Dähn and J. Müller	525
Thin film switching devices using amorphous silicon/silicon carbon multilayers Y. Hatanaka, M. Suzuki, K. Watanabe and Y. Nakanishi	532
Silicon etching techniques and application to mechanical devices T. Bourouina, S. Spirkovitch, F. Marty, F. Baillieu and E. Donzier	536

SEMICONDUCTORS II: SURFACES

Surface structures of tetrahedrally coordinated semiconductors: principles, practice, and universality C.B. Duke	543
Progression of cleavage in Si, Ge, and GaAs D.G. Li, N.S. McAlpine and D. Haneman	553
Surface processes in migration-enhanced epitaxy of III-V compound semiconductors Y. Horikoshi	560
Clean and Ni-adsorbed Si(110) surfaces G. Shimaoka	569
The roughening and pinning transition on vicinal surfaces of Si(100) B. Salanon, L. Barbier and J. Lapujoulade	575
Vibrational properties of H/Si(111)-(1 × 1) surfaces: infrared absorption and electron energy loss spectroscopic studies P. Dumas, Y.J. Chabal and P. Jakob	580
Analysis of boron in CVD diamond surfaces using neutron depth profiling G.P. Lamaze, R.G. Downing, L. Pilione, A. Badzian and T. Badzian	587
Adsorption and decomposition of triethylindium on the Si(100) surface studied by X-ray and ultra-violet photoelectron spectroscopy Y. Fukuda, Y. Suzuki, J. Murata and N. Sanada	593

Early stages of H ₂ O adsorption on clean Si(100) J.P. Lacharme, C. Sébenne, S.M. Chérif, M. Chikhi, N. Safta and M.A. Zaïbi	598
Submonolayer coverage of Ga and B adatoms on a Ge(111) surface C. Cheng and K. Kunc	603
Optical spectroscopy of ordered GaAs(001) surfaces obtained by sulfide passivation V.L. Berkovits and D. Paget	607
Hydrocarbon-based etching of InP Th. Allinger and J.A. Schaefer	614
Halogen-induced surface states acceptors on GaAs(110) surfaces D. Troost, L. Koenders and W. Mönch	619
Atomic nitrogen on InAs(110) surfaces at room temperature T. van Gemmeren, S. Rossi Salmagne and W. Mönch	625
Physisorption and chemisorption of O ₂ on GaAs(110) surfaces: a Kelvin-probe study H. Nienhaus and W. Mönch	632
Temperature programmed desorption study of (NH ₄) ₂ S _x treated GaAs surfaces T. Nomura, T. Yamagata, H. Warashina, K. Ishikawa and M. Hagino	638
Modification of GaAs surface stoichiometry and reactivity induced by a hydrogen plasma C. Debiemme-Chouvy, D. Ballutaud, J.C. Pesant, C. Severac and A. Etcheberry	643
A study of the initial stages of the oxidation of silicon using ¹⁸ O ₂ and RTP J.-J. Ganem, G. Battistig, S. Rigo and I. Trimaille	647
Photon- and catalysis-assisted silicon oxynitridation at room temperature: a comparative study A. Glachant and P. Soukiassian	654
Study of the heterointerfaces InSe on GaSe and GaSe on InSe D. Fargues, L. Brahim-Otsmane, M. Eddrief, C. Sébenne and M. Balkanski	661

SEMICONDUCTOR-BASED HETEROSTRUCTURES

Electronic structure of metal/semiconductor interfaces from cathodoluminescence and soft X-ray photoemission spectroscopies L.J. Brillson, I.M. Vitomirov, A. Raisanen, S. Chang, R.E. Viturro, P.D. Kirchner, G.D. Pettit and J.M. Woodall	667
Theory of the formation of Schottky barriers M. Lannoo and G. Allan	676
Reaction of iron on silicon G. Crecelius	683
Theoretical and experimental study of the Na/Si(100)2 × 1 surface structure L. Spiess, S.-P. Tang, A.J. Freeman, B. Delley, P.S. Mangat, K.M. Schirm, Z. Hurych and P. Soukiassian	690
Allotaxial growth of single-crystal Si/CoSi ₂ /Si(100) heterostructures H.L. Bay, S. Mantl and I. Michel	697
The influence of growth techniques on the structure of epitaxial ErSi _{1.7} on Si(111) D.B.B. Lollman, T.A. Nguyen Tan, J.-Y. Veuillen, P. Muret, K. Lefki, M. Brunel and J.C. Dupuy	704
A photoemission study of erbium silicide ultra-thin films epitaxially grown on Si(111) J.-Y. Veuillen, D.B.B. Lollman, T.A. Nguyen Tan and L. Magaud	712
Epitaxial Er silicide formation on Si(111) in the monolayer range P. Wetzel, C. Pirri, D. Bolmont and G. Gewinner	718
Electrical and photoelectrical properties of ErSi _{1.7} /Si junctions P. Muret, G. von Blanckenhagen, K. Lefki, T.A. Nguyen Tan and D. Lollman	725

Valency changeover at the Sm/Si(111)7 × 7 interface through chemisorption and epitaxy O. Sakho, M. De Santis, M. Sacchi, F. Sirotti and G. Rossi	729
The growth of Ag on Si(100)-2 × 1 Y. Borensztein and R. Alameh	735
Investigation of the Si(100)2 × 1/Cu interface by UPS and surface reflectance spectroscopy S. Guillet, L.E. Regalado, T. Lopez-Rios and R. Cinti	742
Microstructural and compositional characterization of TiW/Al(0.8%Si)/TiW/PtSi/(100)Si A. Ashkenazi, Y. Komem and I. Lerner	746
Electronic transport properties of amorphous W/Si multilayers E. Majkova, P. Lobotka, I. Vavra, S. Luby, M. Jergel, S. Benacka, R. Senderak, B. George and M. Vaezzadeh	752
Electrical characteristics of metal/a-Si _x C _{1-x} :H contacts K. Okada, K. Ishikawa, M. Akimoto and Y. Gekka	758
X-ray diffraction and <i>I-V</i> curve studies on the Al/Ti/Al/n-GaAs Schottky contact after annealing at various temperatures J.-R. Chen and N.-L. Chang	762
Schottky barrier formation for In deposited on GaAs(110): the low coverage limit J. Ortega, R. Rincón, F.J. García-Vidal and F. Flores	766
Internal photoemission in metal/ β -FeSi ₂ /Si heterojunctions K. Lefki and P. Muret	772
Optical studies of InP/InAlAs/InP interface recombinations P. Abraham, Y. Monteil, M. Sacilotti, T. Benyattou, M.A. Garcia, S. Moneger, A. Tabata, R. Landers, J. Morais and M. Pitaval	777
OBIC measurements on planar high-voltage p ⁺ -n junctions with diamond-like carbon films as passivation layer M. Frischholz, Th. Mandel, R. Helbig, G. Schmidt and A. Hammerschmidt	784
Search for photoinduced dipoles at heterojunction interfaces T. dell'Orto, G. De Stasio, M. Capozzi, C. Ottaviani, C. Quaresima, P. Perfetti, Y. Hwu and G. Margaritondo	789
Electrical and optical properties of heterostructures made from diamond-like carbon layers on crystalline silicon Th. Mandel, M. Frischholz, R. Helbig, S. Birkle and A. Hammerschmidt	795
Electronic states at the first stages of epitaxial growth of Fe silicides on Si(111)7 × 7 F. Sirotti, M. DeSantis, X. Jin and G. Rossi	800
TM waves of a nonlinearly bounded semiconductor surface and film A.D. Boardman, P. Egan and R.F. Wallis	806
Photoluminescence study of the 2D electron gas formed at the interface of strained InGaAs/InP single heterostructures A. Tabata, T. Benyattou, D. Pogany, G. Guillot, S.A. Clark, J.E. MacDonald, D.I. Westwood and R.H. Williams	814
Epitaxial growth of rare earths and rare-earth compounds on II-VI semiconductors B. Daudin, P. Gros, E. Ligeon and A.C. Chami	821
Chemical composition by Auger sputter-depth profiles of GaAs oxide layers formed after chemical or Ar ⁺ ion etchings J.F. Bresse	825
Metalorganic chemical vapor deposition of ZnSe thin films on ITO/glass substrates C.T. Hsu, Y.K. Su, T.S. Wu, M. Yokoyama, M. Takahashi, T. Nakada and Y. Hashimoto	831
Tunnel current in n-poly-Si/SiO ₂ /n-Si structures with the 40-75 Å thermally grown silicon oxide films under very strong fields O.G. Balev, S.G. Bantser, A.I. Klimovskaja, Y.A. Okhrimenko, E.M. Kostenko, A.A. Malashkevich and V.E. Jasnikov	835

O 1s investigation of SiO ₂ /Si interface formation using an alkali metal promoter M. Riehl-Chudoba, S. Nishigaki, Y. Huttel, F. Sèmond, Ph. Brun and P. Soukiassian	840
Electronic promotion of silicon oxynitridation at room temperature by alkali-metal catalysts A. Glachant, P. Soukiassian, S.T. Kim and Z. Hurych	847
Structural and electrical properties of Al ₂ O ₃ thin films on p-Si grown by low-pressure metalorganic chemical vapor deposition T.W. Kim, S.S. Yom, W.N. Kang, Y.S. Yoon, C. Kim, S. Kim, I.S. Yang and Y.J. Wee	854
Constant capacitance technique to study electrical instabilities in InP MIS provided by PECVD silicon nitride C.H. Kim, S.D. Kwon, B.D. Choe, I.K. Han, J.I. Lee, K.N. Kang, H.L. Park and H. Lim	858
Author index	863
Subject index	873